

Two series of measurements were made on this section of the river--the first on July 17 and 18, 1974, and the second on August 28 and 29, 1974. Hereinafter the process which involved the taking of this series of measurements will be referred to as a "run". Each run consisted of obtaining measurements of the river and tributaries at 13 points and the measurement of 47 canals and ditches. Personnel involved in these runs were Donald C. Norseth, Robert F. Guy, and Gary Cupp of the Division of Water Rights and David Clayburn, Duchesne River Commissioner. Personnel of the United States Geologic Survey, Nick Panas, Leon Jensen, and Dale Webb, provided stream-gaging data and measurements which were very helpful in correlating stream flow. Leo Brady of the Central Utah Project provided the Strawberry River inflow to Starvation Reservoir and releases from the reservoir.

During the runs it was found that attempting to determine the return flow from each canal was impractical because the water from the upper canals was observed flowing over the ground surface into other canals before reaching the river. The influence of irrigation onto the river-adjacent lands on stream flow was impracticable to evaluate at the times of the runs because infiltration into the river from irrigated lands, inflow from springs, swamps, and small tributaries could not be separated and identified. The field work in 1974 was expended in measuring the river and the canals and ditches to determine the effect that the diversion of water had on the flow of the Duchesne River in the selected reaches. A graphic flow chart of the section is included as Chart 3 on Page 12. The measurements made during 1974 for the four reaches are tabulated below

IV. Tabulation of 1974 Measurements

Reach 1:

Place of Measurement	c.f.s.	c.f.s.
<u>First Run</u>		
<u>Streamflow:</u>		
Big Springs Area	10.4	
West Fork below Dry Hollow	24.5	
Wolf Creek below Rhoades Canyon	10.2	
North Fork below Haydes Creek	48.4	
Total		93.5
<u>Diversions:</u>		
Orven J. Moon No. 1 (322)	0.0	
Orven J. Moon No. 2 (322)	0.0	
Orven J. Moon No. 1 (320)	3.0	
Orven J. Moon No. 2 (321)	3.0	
Orven J. Moon No. 3 (217)	2.9	
Orven J. Moon No. 4 (241)	2.9	
Orven J. Moon No. 3 (322)	3.0	
Willis Moon (282)	5.0	
Alfonzo Defa	6.0	
Tayne Wilkens	0.5	
McAfee (Swift Creek)	6.0	
Big Springs	6.9	

Place of Measurement	c.f.s.	c.f.s.
Rhoades	38.1	
Turnbow	3.6	
unnamed	1.5	
Total		82.4
<u>Second Run</u>		
Streamflow:		
Big Springs Area	6.1	
West Fork below Dry Hollow	12.1	
Wolf Creek below Rhoades Canyon	7.8	
North Fork below Haydes Creek	30.5	
Total		56.5
Diversions:		
Orven J. Moon No. 1 (322)	0.0	
Orven J. Moon No. 2 (322)	0.0	
Orven J. Moon No. 1 (320)	0.0	
Orven J. Moon No. 2 (321)	1.5	
Orven J. Moon No. 3 (217)	0.0	
Orven J. Moon No. 4 (241)	0.0	
Orven J. Moon No. 3 (322)	1.5	
Willis Moon (282)	0.2	
Alfonzo Defa	2.0	
Tayne Wilkins	no measurement	
McAfee (Swift Creek)	no measurement	
Big Springs	3.6	
Rhoades	19.6	
Turnbow	2.0	
Total		30.4

Reach 2:

Place of Measurement	c.f.s.	c.f.s.
<u>First Run</u>		
Streamflow:		
Duchesne River at Hanna	76.0	
Farm Creek	3.0	
Total		79.0
Diversions:		
Orven N. Moon (211)	0.0	
Defa (244)	0.0	
Little Farm Creek	2.7	
Farm Creek	44.9	
Jessop Thomas	0.0	
Jasper Pike	19.0	
Tabby	34.9	
Jim Bridger	abandoned right	
	changed to Tabby	
Hicken	12.4	

Place of Measurement	c.f.s.	c.f.s.
Wagstaff	4.0	
Brown	3.9	
Jesse Peterson (Abplanab)	1.8	
Total		123.6
<u>Second Run</u>		
Streamflow:		
Duchesne River at Hanna	58.0	
Farm Creek	2.0	
Total		60.0
Diversions:		
Orven N. Moon (211)	0.0	
Defa (244)	0.0	
Little Farm Creek	2.0	
Farm Creek	31.7	
Jessop Thomas	3.6	
Jasper Pike	17.4	
Tabby	18.1	
Hicken	8.5	
Wagstaff	2.2	
Brown	2.0	
Jesse Peterson (Abplanab)	1.0	
Total		86.5

Reach 3:

Place of Measurement	c.f.s.	c.f.s.
<u>First Run</u>		
Streamflow:		
Duchesne River near Tabiona	102.0	
Rock Creek near Talmage	158.0	
Total		255.0
Diversions:		
Broadhead	17.0	
Jones No. 1	2.0	
West Rock Creek	1.5	
Indian (James Mountain)	1.5	
Knight	8.0	
Shanks	9.5	
Pioneer	26.3	
Total		65.8
<u>Second Run</u>		
Streamflow:		
Duchesne River near Tabiona	93.0	
Rock Creek near Talmage	60.7	
Total		152.7

Place of Measurement	c.f.s.	c.f.s.
Diversions:		
Broadhead	7.5	
Jones	1.2	
West Rock Creek	1.4	
Indian (James Mountain)	1.0	
Knight	5.5	
Shanks (7.0 c.f.s. is project water)	11.0	
Pioneer	26.7	
Total		54.3

Reach 4:

<u>First Run</u>		
Streamflow:		
Duchesne River about Knight Diversion	193.0	
Strawberry River above Starvation Res.	85.0	
Starvation Reservoir Storage Release	309.0	
Total		587.0
Diversions:		
Knight Diversion	0.0	
Murray-White	16.0	
Rocky Point	51.8	
Madsen	3.0	
Yannaward (City Ditch)	3.0	
Porter Merrill Pump	0.0	
Child (not being used)	0.0	
Hamilton (Hollenbeck)	6.0	
Meacham	0.0	
Duchesne Feeder	160.0	
Grey Mountain	270.0	
Pahcease (diverting through Duchesne Feeder)		
Myton Townsite	122.5	
Total		633.2
<u>Second Run</u>		
Streamflow:		
Duchesne River about Knight Diversion	92.0	
Strawberry River above Starvation Res.	46.0	
Starvation Reservoir Storage Release	306.0	
Total		444.0
Diversions:		
Knight Diversion	0.0	
Murray-White	19.0	
Rocky Point	45.0	
Madsen	1.5	
Yannaward (City Ditch)	4.5	
Porter Merrill Pump	0.0	
Child (not being used)	0.0	

Place of Measurement	c.f.s.	c.f.s.
Duchesne City	3.0	
Hamilton (Hollenbeck)	4.0	
Meacham	6.5	
Duchesne Feeder	129.0	
Grey Mountain	255.0	
Pahcease (diverted through Duchesne Feeder)		
Myton Townsite	59.0	
Total		526.5

V. Summary of 1974 Measurements

1	2	3	4	5	6	7	8	9	10	11
Reach	Run	Inflow ^{1/}	Diverted	Outflow ^{2/}	Flow ^{3/}		Flow Increase ^{4/}		Flow Increase	
		c.f.s.	c.f.s.	c.f.s.	c.f.s.	%	c.f.s.	%	c.f.s.	%
1	1	93.5	82.4	76.0	17.5	18.7			64.9	69.4
1	2	56.5	30.4	58.0			1.5	2.7	31.9	56.5
2	1	79.0	123.6	102.0			23.0	29.1	146.6	185.6
2	2	58.0	86.5	67.2			7.2	12.0	93.7	156.2
3	1	255.0	65.8	193.0	62.0	24.3			41.5	16.3
3	2	152.7	54.3	92.0	60.7	39.8			-6.4	-4.2
4	1	587.0	633.2	175.0	412.0	70.2			221.2	37.7
4	2	444.0	526.5	47.4	396.6	89.3			129.9	29.3
Total Inflow in All Reaches from All Sources							Run 1:	474.2		
							Run 2:	249.1		
Average Percentage Increase of All Reaches							Run 1:	77.3		
							Run 2:	59.5		

^{1/} Measured flow at top of reach.

^{2/} Measured flow at bottom of reach.

^{3/} Difference between Columns 3 and 5.

^{4/} Increase or decrease in water supply due to inflow between measuring points at bottom and top of reach.

V. Summary

The Duchesne River return flow study was partially completed during the 1974 irrigation season. The work was carried out in two phases during July and August when river flow and diversions were stable enough for measurement without large fluctuations. Field work was reconnoitering